Gupta

Polymer Matrix Syntactic Foams

Microstructure, Properties, and Applications

Introduces readers to the far-reaching uses of polymer matrix syntactic foams for developing structures which require lightweight, but high mechanical, properties A cohesive introduction to polymer matrix syntactic foams, this book helps readers understand how the innovative use of porosity can help in developing lightweight materials with high mechanical properties. The author provides a detailed comparison of syntactic foams with other lightweight materials, which are presented in terms of mechanical properties and failure mechanisms. Comparison charts are also included for mechanical properties such as strength and modulus with respect to density. The book also lays the foundation for understanding the matrix materials and microspheres that are typically utilized in the making of these lightweight materials. How the properties and characteristics of syntactic foams can be further improved via the use of reinforcement materials such as nanoparticles, nanofibers, conventional fibers and toughening rubbers, are also considered. * By focusing on structural characteristics, the author ensures that readers without an advanced technical background can engage with the subject * Includes comparison charts, comparing syntactic foams with other lightweight materials, to visually show trends between them in a clear manner * Features a large collection of micrographs of raw materials and different types of syntactic foams * Types and applications covered include self healing syntactic foams and metal matrix syntactic foams for weight saving applications such as in aerospace design * Coverage of production and processing enables readers to integrate processes into established production chains * Growing topics in the area such as nano aspects are also considered Essential reading for Practicing engineers in boat, ship, and aircraft industries working on composite materials, Mechanical engineers, Product designers, Aerospace, Automotive and Naval Industry personnel.

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